## III. REMARKS/ARGUMENTS

4. The Office Action Dated December 17, 2003 has been carefully considered. Reconsideration of this application, as amended and in view of the following remarks, is respectfully requested.

### A. References

5. The following U.S. patent was considered in the office action:

- US Patent 5,715,823 ("Wood"), filed September 25, 1996.

### B. Overview of Office Action

6. The office action:

a) rejected claims 1-7, 23-27, 33, 34, and 36 as being anticipated by Wood under 35 U.S.C. 102(a), and

b) rejected claim 32 as being obvious in light of Wood under 35 U.S.C. 103(a).

c) rejected claim 35 as requiring new matter 35 U.S.C. 112.

### C. Claim Rejections under 35 U.S.C. 102

7. The office action rejected claims 1-7, 23-27, 33, 34, and 36 as being anticipated by Wood under 35 U.S.C. 102(a).

**Terminology**

8. Wood teaches an invention that combines two areas of art: one the art of medical imaging, specifically ultrasound imaging; and the second, the art of computer graphics images and video as generally used with the World Wide Web ("Web"). Both of these areas of art have specific technical terms of art. The same word may have a substantially different meaning in one art area than that word would have in the other art area. This is true of several

terms in the convergent areas covered by both Wood and the present application. For example, the word "image" may mean one thing to a medical doctor and a substantially different thing to a computer graphics expert. One skilled in art of these applications would need to have an understanding of both the art of medical imaging and the art of computer graphics and video and would have to carefully read the specifications to determine the proper meaning of the word in a particular context.

**Different Meanings of "Image"**

9. In computer graphics and video, an "image" is a single graphic or a single frame of a video. For example, the two most common types of images on the Web are GIF images and JPEG images. These are generally limited to a single graphic. There is also a file format known as animated GIF that allows for a relatively small finite sequence of predetermined animation frames that are played back as an animation.

10. On the other hand, in the medical imaging, an "image" may be a single frame, a sequence of multiple frames, or a live display of an infinite sequence of frame being viewed real-time. When a relatively small finite number of predetermined frames are stored together, the collection is referred to as a "cineloop". (A cineloop typically contains less than 30 frames such as a single heart cycle or a one second capture of frames at 30 frames a second.) The live, real-time display of medical data is also referred to as the "image".

11. It is clear from the Wood specification that the term "image" is used to refer to single frame, such as a JPEG or GIF image, or to a finite number of predetermined frames, such as a cineloop. See "image", "cineloop", and "click an image" in Figures 5 and 14, "images" in Figures 12 and 13, JPEG and GIF images (Wood 10:2-9). The description of the update button in Fig 10 (11:44-49) shows that the remotely displayed image is a *single frame* that

is updated by displaying the "ultrasound image most recently produced". Cineloops are described as "animated real time loops of images" (i.e. loops of single frames) that are displayed in HTML Web pages (Wood 8:10-15) (e.g. animated GIFs). These uses are all consistent with the term as used in the field of computer graphics and video as used in the Web and are *not* consistent with the term as used in medical imaging.

**Different Meanings of "Video"**

12. In computer graphics and video, a "video" is a movie or a relatively long or infinite sequence of frames. For example, the two most common types of video on the Web are QuickTime movies and Video for Windows (now known as Widows Media movies). These are capable of containing relatively long movies (over 2 hours) and can include live streaming video where the sequence of frames is not predetermined or finite. Digital video cameras a capable of producing an infinite stream of video frames.

13. On the other hand, in the medical imaging, the term "video" not used to describe the medical image, but is used to describe convention video devices, such as a video display, video tape, and video tape players.

14. It is clear from the Wood specification that the term "video" is used in the Internet Web or conventional sense. (See, e.g. Wood 3:6-9). Prior to the invention of the present application, live Internet streaming of clinical quality medical video was not possible with conventional equipment and Internet connections known to Wood. This is precisely why Wood does not disclose the display of live transmissions of video. Instead, Wood teaches transmission of single frames or a relatively small or finite number of predetermined frames in a cineloop (see the entire discussion of image above.

15. Wood also uses the term video in reference to a video processor located in the on the sending end, the ultrasonic diagnostic imaging system, "The images may also be further processed by a video processor (not shown) to be placed in a raster format suitable for display on a system display 26." It is clear from the context that this "video processor" is not involved in the transmission of Woods still images and cineloops but is a local video graphics adapter (VGA) for conversion of the image for display on the local display screen.

**Live and Real-time Streaming versus Store-and-Forward**

16. In the context of video transmission systems, the terms live, real-time, and store and forward have different meanings. Live video is video that can be viewed as it is being transmitted. Real-time video is displayed at the same frame rate that it was transmitted live, or at the same frame rate that it was captured (as opposed to slow motion). Because live video is always real-time, those skilled in the art sometimes use real-time to mean live. Video can be recorded and played back in real-time. In order to have transmission, receipt, and display of live or recorded video in real-time the video data must be streamed.

17. In a store-and-forward system, video frames can be captured in real-time, stored as a finite number of predetermined frames, transferred (or forwarded) at a rate *less than* real-time, and then played back in real time.

**Wood Is Not Live, But Store-and-Forward**

18. Wood only uses of the term "real time" twice in conjunction with images (i.e. "animated real time loops of images" at 8:14-15, and "play the real time image sequence" at

9:62-63)[1]. It is clear that both of these uses refer to real-time *playback* and not real-time *transmission*. Wood only discloses a store-and-forward system, not a live system.

**MPEG Predates**

19. Both JPEG and MPEG were well known in 1996 when Wood filed his original patent application. US Patent number 4,704,628 dated November 3, 1987, teaches the basic concepts of MPEG's intraframe and interframe transform coding. The MPEG1 Standard was published in 1993. Wood did not teach the use of MPEG or any other compression that would have been suitable for video streaming. Thus the present invention does not simply update the prior art but breaks new ground.

**Overview of Wood**

20. Wood teaches an ultrasonic diagnostic imaging system with universal access to diagnostic information and images. Wood teaches that the medical ultrasonic diagnostic imaging system is capable of being accessed over data communication networks such as the Internet, making the ultrasonic images, diagnostic reports and ultrasound system diagnostics information and operation accessible to a conventional personal computer at virtually any remote location. Wood however appears to teach that only single images, or a relatively small number of predetermined frames, are transmitted from the ultrasonic diagnostic imaging system to the user's computer, at a rate that is less than real-time. Wood does not disclose the transmission of live, clinical quality medical video. Wood is limited to a Web based system where the sending computer includes an HTTP server (item 30 in Fig 1 and 2, and as shown in

[1] A third use of the term real-time is used to describe the multitasking nature of the multi-tasking operating system (12:13-23).

Fig 15 and 16) and the receiving computer includes a Web Browser (item 104 in Fig 1 and 3, and as shown in Fig 4-14).

**Overview of the Present Invention**

21. The present invention teaches an video communication system. The invention includes methods of and apparatus "for *transmitting video* images preferably allows a specially trained individual to remotely *supervise*, instruct, and *observe* administration of medical tests conducted at remote locations" (Summary of the Invention). In order to achieve the objectives of the invention, the system must be able to transmit live video, in real-time. "The transmitting device transmits the video images to the remote receiving device ... for live display" (Summary of the Invention). Unlike Wood, the present invention is capable the transmission of live, clinical quality medical video with conventional computer equipment and readily available Internet connections. Unlike Wood, the present invention is not limited to the HTTP Server and Web Browser.

**D. Claims Amendments to Show Live or Real-time Streaming**

22. Claims 1, 2, 4, 6, 23, 27, and 32 have been amended to use the phrase "stream of video images." Claims 23, 32 and 33 have been amended to use the term "real-time." Note that claim 32 was previously presented with the term "live".

**E. Claims 1, 23, 33 Not Anticipated or Made Obvious by Wood**

23. Claims 1, 23, and 33 have been amended to require a "stream of video images". Claim 33 have been amended to require "real-time video being transmitted". As discussed above, Wood's image is not a stream of video images or real-time video transmission. Wood's image is a single frame, or an animated GIF, but is not the same or equivalent to the stream of video images or real-time video transmission, required by independent claims 1, 23,

and 33. This fundamental element of the claimed invention is entirely lacking in Wood. For this reason alone, all three independent claims and their dependent claims should now be allowed.

24. A transmitter as claimed by the present invention is not a modem as disclosed by Wood. The transmitter of the present invention must be able to "functions as a server within the computer network", can be can be couple to both a video source 101 and a recorded video device 104 (see, discussion regarding Fig 1). A modem cannot function as a computer network server. A modem cannot be connected to both a video source and a recorded video device at the same time. A modem is not the same as, or equivalent to, the transmitter of the present invention.

25. Further, as discussed above, Woods "video processor" is not involved in the transmission of Woods still images and cineloops but is a local video graphics adapter (VGA) for conversion of the image for display on the local display screen. This does not anticipate or render obvious the real-time streaming of the present invention.

26. Similarly, Wood's use of the word "video" at 11:59-63 does not clearly teaching the real-time streaming video images from the medical device to the remote viewer. In fact in the previous paragraph (11:44-49) Wood teaches away from streaming video in requiring an update button to send a single image. This does not anticipate or render obvious the real-time streaming of the present invention.

27. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from being able to transmit live, clinical quality streaming video, an instead teaches receipt of single frames, or a pre-recorded cineloop, in a conventional store-and-forward approach. Thus, Wood does not render the claims obvious.

**F. Claim 2 Not Anticipated or Made Obvious by Wood**

28. Claim 2 has been amended to require a "compressor for compressing ... the stream of video images". Wood only discloses JPEG and GIF compression algorithms that are typically used only for still images or small, finite number of frames not for video streaming. Wood does not teach a video stream compressor, even though video compression algorithms such as MPEG were well known (as discussed above). In this regard, Wood teaches away from using a video compression algorithm.

29. A JPEG or GIF compressor is not the same as, or equivalent to, the compression algorithm of the present invention.

30. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a compression algorithm that is enabling to transmit live, clinical quality video, an instead teaches compression of single frames, or a pre-recorded cineloop, or a GIF animation. Thus, Wood also does not render claim 2 obvious.

**G. Claim 3 Not Anticipated or Made Obvious by Wood**

31. Claim 3 requires a "decompressor" for decompressing "compressed stream of data". Wood does not clearly teach a decompressor for a video stream.

32. A JPEG or GIF decompressor is not the same as, or equivalent to, the decompressor of the present invention.

33. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a decompressor that is enabling to display live, clinical quality streaming video. Thus, Wood does not render claim 3 obvious.

**H. Claim 4 Not Anticipated or Made Obvious by Wood**

34. Claim 4 requires a "recording device ... for storing the data representing the stream of video images...". Wood does not clearly teach a recording device for storing a data representing the compressed data of the present invention.

35. An image store storing a single frame, or a relatively small number of frames such as a cineloop, is not the same as, or equivalent to, the recording device of the present invention.

36. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a recording device that is enabling to replay and real-time transmission of clinical quality video. Thus, Wood also does not render claim 4 obvious.

**I. Claims 5 and 24 Not Anticipated or Made Obvious by Wood**

37. Claims 5 and 24 are dependent claims and, for all the reasons stated above with respect to independent claims 1 and 23, should be patentable over Wood.

**J. Claims 6 and 25 Not Anticipated or Made Obvious by Wood**

38. Claims 6 and 25 are dependent claims and, for all the reasons stated above with respect to independent claims 1 and 23, should be patentable over Wood.

39. Further, claim 6 requires a "network... for transporting the data representing the stream video images". Data representing a single frame, or a relatively small number of frames such as a cineloop, is not the same as, or equivalent to, the data of the present invention. As discussed above, Wood does not clearly teach data representing a video stream.

40. Thus, Wood does not teach all of the required elements of the claimed invention. Wood also does not render claims 6 and 25 obvious.

**K. Claims 7 and 26 Not Anticipated or Made Obvious by Wood**

41. Claims 7 and 26 are dependent claims and, for all the reasons stated above with respect to claims 1, 6, 23, and 25, should be patentable over Wood.

**L. Claims 27 and 34 Not Anticipated or Made Obvious by Wood**

42. Claims 27 and 34 are dependent claims and, for all the reasons stated above with respect to independent claims 23 and 33, should be patentable over Wood.

43. Claim 27 requires user remote control of "parameters of plurality of *video* images including *frame rate* and *frame size*" (emphasis added). While Wood does disclose user remote control of the medical device, Wood does not clearly teach controlling video parameters. There is no teaching of controlling video frame rate or video frame size. In fact, the specification does not contain the terms "video frame", "frame rate" or "frame size".

44. Claim 34 requires an element were a user "control command specifies a *subset of the area* of said digitized *frames* [of a *video being transmitted*]" (emphasis added). While Wood does diclose user remote control of the medical device, Wood does not clearly teach controlling video parameters. There is no teaching of controlling the subset of the area of a video frame being transmitted live. In fact, the specification does not contain the term "subset".

45. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a live observation of transmitted live, clinical quality stream video. Thus, Wood also does not render claims 27 and 34 obvious.

**M. Claim 36 Not Anticipated or Made Obvious by Wood**

46. Claim 36 is a dependent claim and, for all the reasons stated above with respect to independent claim 33, should be patentable over Wood.

47. Claim 36 requires an element were a user "control command allows the remote user to *start or stop* the *transmission* of said [*real-time*] *video* [*being transmitted*]" (emphasis added, limitations of claim 33 inserted). While Wood does user remote control of the medical device, as discussed above Wood does not teach real-time transmission of streaming video. Wood lacks any motivation for starting or stopping the real-time transmission, because there is no real-time video transmission. The claimed element would make no sense in the system as taught by Wood. There is no teaching of starting or stopping video transmission. In fact, the specification does not contain the terms "start" or "stop". Further, starting and stopping transmission of a video is not inherent in the teaching of Wood, instead wood teaches away by requiring an update button (as discussed above in reference to Fig 10 and 11:44-49).

48. Thus, Wood does not teach all of the required elements of the claimed invention. Further Wood teaches away from a live observation of transmitted live, clinical quality streaming video. Thus, Wood does not render claim 36 obvious.

**N. Claim Rejections under 35 U.S.C. 103**

49. The office action rejected claim 32 as being obvious in light of Wood under 35 U.S.C. 103(a). Claim 32 is a dependent claim and, for all the reasons stated above with respect to independent claim 23, should be patentable over Wood.

**O. Claims 32 Not Rendered Obvious by Wood**

50. The office action cited Wood for rendering claim 32 obvious. Claim 32 as amended requires several elements not disclosed or taught by Wood. The elements of claim 32 include more than *broadly providing a mechanical means* to replace manual activity that can accomplish the *same result*. In addition to adding a requirement for robotic device, claim 32 requires an element where the video image is "a *substantially live video*" and an element where

the "remote receiver *receives* and *displays* said *live video* substantially *in real-time*", whereby the user can control the robotic device "while viewing the live video". As discuss above Wood does not teach the required elements of "stream of video images", "live video", a receiver that "receives and displays said live video".

51. Further, Claim 32 has been amended to add a restriction "wherein said robotic device responds to said control commands in substantially real time," and "whereby the remote user can perform procedures with the robotic device and the medical device with substantially real-time control and real-time visual feedback." The invention as claimed by claim 32 allows the doctor to perform a remote procedure while viewing live video. The live video feedback is required to enable the doctor to have correct perception to guide the doctor in performing a remote procedure. In a system as taught by Wood, the doctor cannot view the live video in real-time (but rather only see still images upon request with the update button, or a cineloop after a delay for the creation and download of the file); consequently the remote doctor cannot safely perform the remote procedure. The invention as claimed results in a *substantially new* and *different result* than the result possible with the teachings of Wood. This invention brings the hands of the physician from a remote viewing location not only to the medical device but to the patient as well, which is much different than merely replacing the hands of a non-physician. Thus, Wood fails to render claim 32 obvious, even under the cited case law.

**P. Rejection under 35 U.S.C. 112**

52. The office action rejected claim 35 as requiring new matter 35 U.S.C. 112, in that "a plurality of video compressors" would constitute new subject matter. Claim 35 has been amended to use the wording of the specification and now reads "a compressor which can be configured to use a plurality of video compression algorithms".

53. The specification provided the following support: "The compressor 204 preferably utilizes a *lossless compression* algorithm", "the compressor 204 utilizes a *lossy algorithmic system*", and "Preferably, the video controller 207 relays information regarding the frame size, frame rate, *compression algorithm*, and other parameters being transmitted to the video controller 207 via the data link 220. Thus, *a user interfacing with one of the plurality of receivers 206 is able to modify the frame size, frame rate, compression algorithm*, and other parameters of the incoming stream of video images to one of the plurality of receivers 206. Since the plurality of receivers 206 and the transmitter 201 are preferably located in remote locations, by interfacing with the video controller 207, the *user is able to remotely control video parameters such as frame size, frame rate, compression algorithm*, and the like *which are included within the video settings* 211 at the *transmitter* 201." (empasis added).

54. The specification discloses a compressor using a lossy compression method or a lossless compression method. The specification further taught remote selection or changing of the selection of the compression method.

55. Claim 35 should now be allowable under 35 U.S.C. 112 because the new language does not introduce new matter.

## II. Reconsideration Requested

56. The undersigned respectfully submits that, in view of the foregoing amendments and remarks, the rejections of the claims raised in the Office Action dated December 17, 2003 have been fully addressed and overcome, and the present application is believed to be in condition for allowance. It is respectfully requested that this application be reconsidered, that these claims be allowed, and that this case be passed to issue. If it is believed that a telephone conversation would expedite the prosecution of the present application, or

clarify matters with regard to its allowance, the Examiner is invited to call the undersigned inventor at 408-739-9517.

Respectfully submitted,

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